Colour feeling of the Japanese (II) The expressive emotional effects of colours

Colour feeling of the Japanese (II)
The expressive emotional effects of colours

By

Yuuwoo Tatibana

(立 花 祐 雄)

(*Psychological Institute, Tohoku Imperial University, Sendai*)

In a recent study[1] in which the writer considered the emotional effects of colours, i. e. the inherent and expressive values of individual colours, the four inherent values of the Japanese were first explained from the result of our own experiment obtained from 101 subjects, including 65 men and 36 women. The inherent value is the emotional effect of colours which is not connected with other objective meanings, or which even scarcely depends upon individual experiences, that is to say, it is the effect which seems invariable in colour itself. But we are accustomed to estimate a colour and the colour pattern of any object with various kinds of expression other than the inherent value, for example, with the expression, "the colour is loud, or too gaudy or felt a little aged etc." The writer also made an experiment for such expressions in connection with the individual colours generally in use in daily life.

These emotional expressions for colours are rather subejctive and depend really in a wide sense upon contrast, in other words, their values easily change as an object changes in other ways than

[1] Tatibana, Y., Colour Feeling of the Japanese; The Inherent Emotional Effects of Colours. Tohoku Psychologica Folia, V–I, 1937.

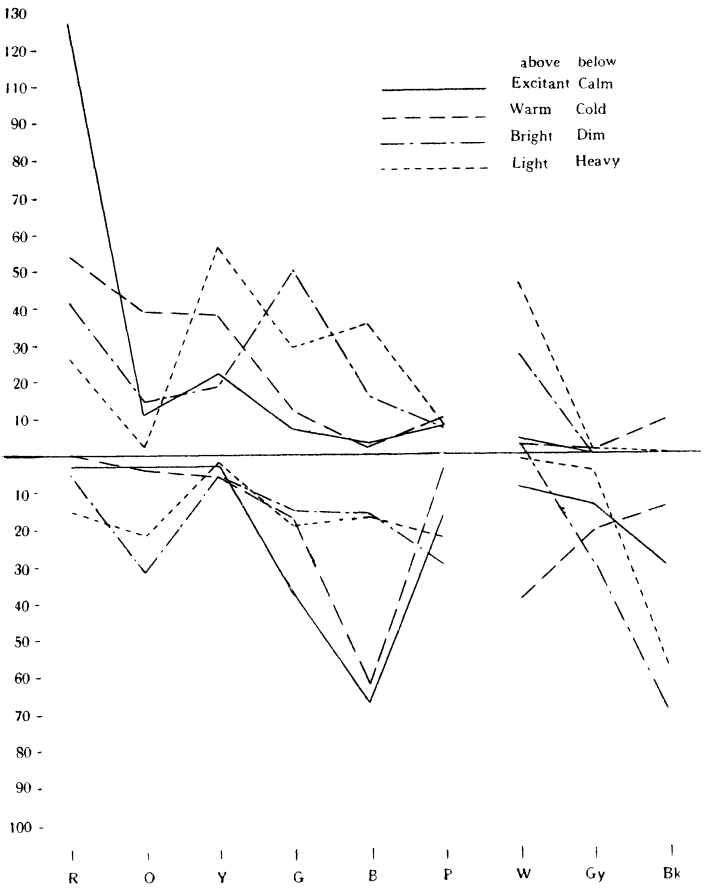

Fig. 2. Inherent values for colours from memory.

in colour itself, and the changes may depend upon any association which is dominant in our minds, but are never connected with a fixed association. Here is an objective meaning of colours smaller than the inherent value, but which can also be considered as being influenced by individual associations, such as age and the time in which one lives and sex. We call these emotional effects 'expressive values of colours'. However, the expressive values differ from the inherent values in degree and they contain relatively great individuality, but have on the whole a regular

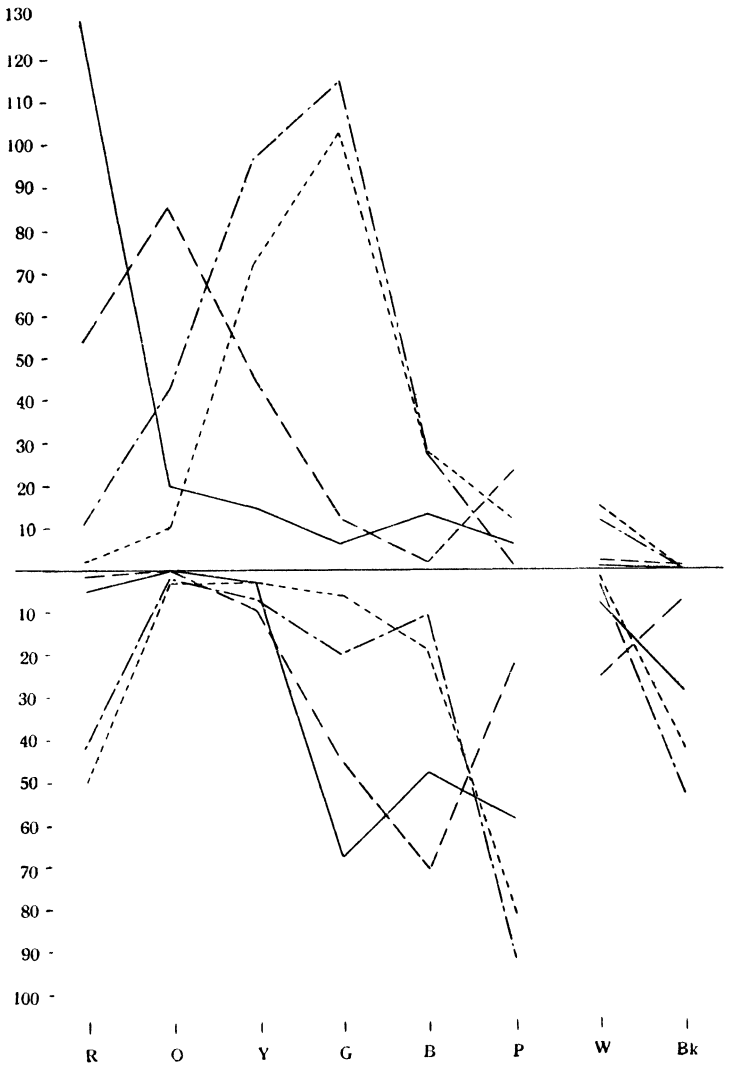

Fig. 3. Inherent values for perceptional saturated colours.

emotional effect for any colour in any human being.

Now colour preference at any time can not be explained entirely from only the likes or dislikes of certain colours that people may have. Inquiring about a fashionable colour, we find the following fact to be almost always true that the reason for preference in a certain colour lies usually in the feeling of satis-

faction it gives to the vanity and curiosity of the people. In such a case, the question as to whether his likes and dislikes are satisfied may be passed over without consideration. In the fashionable colours of kimonos, for which likes and dislikes appear to be disregarded by textile manufacturers many phases, mental or economical, of our social life are found; in other words, the colour is not always selected according to the people's likes, but there is a tendency on the part of people, so to say, to adapt themselves to that colour. The emotional value of a fashionable colour thus contains various social elements rather than individual ones, and has a universal validity for a certain period and a certain nation.

Of the expressive value of colour the four popular emotional colour effects were investigated in our experiment, 'Favourite-Unfavoured,' 'Noble-Vulgar', 'Youthful-Aged' and 'Lively-Lonely'. The other effects, for example, modern-antiquated, frank-tedious etc. were omitted from the result of this experiment, because most of the subjects were not practiced in the consciousness of emotional estimations for individual colours and so found it difficult to recall these values from memory.

The case of the experiment in which the choice of colour names for any emotional value was left entirely free is called Method I. In the second case, in Method II, the emotional effects of colours were judged with the perceptional colours from Wundt's (Zimmermann's) and M. Bradley's colour papers. The judgement in both cases had to be intuitional, free from any conscious associations. And we would like here to quote the inherent values arranged by a new method of adjustment at this time in Fig. 2 and 3 for purposes of reference.

Favourite-Unfavoured

Of course a colour is not invariably preferred without influence by some object on which it appears or by some colour combination, and the colour preference seems to be also undetermined. But we find a fixed tendency of colour preference for the individual

colours of a nation, though in these there may be consciously dominant associations, as our subjects often stated.

As an expressive value likes and dislikes for colours is essentially independent from other expressive values, or does not include them in its value.

For the purpose of comparison with our experiment we would like to introduce an outline of the recent studies on colour preference, especially of the studies of Japanese preference, before the result of the present investigation is explained.

As a most remarkable investigation for our colour feeling, the study concerning intentional types of colour of Allesh[2] in which the experiences of the subjects were minutely described should be noticed. We do not know of any other introspective study such as his report having been made during the past ten years. The greater part of the investigations are dealt with statistically.

I recommend any one who wants to know thoroughly the recent studies on colour preference, to read the introduction of Guilford, : 'The affective value of colour as a function of hue, tint and chroma', in which however the particular conditions of the experiments are almost excluded. Colour tones, both of colour papers and the colour lights used in these experiments are numbered from 7 to 14, and with such a small number of saturated colour papers the preferences are considered statistically, not introspectively. And yet the colours being almost all from M. Bradley's papers, preferences of men of the white race of course occupy the greater part of the investigations.

Of the order of preference of school children, age 7 to 12 years, Staples[4] found that red sinks from the second to the third rank of choice according to the growth in years while blue comes to be most liked. Yellow occupies the lowest position. By Gale[5] the

---

[2] Allesch, G. L. von, Die ästhetische Erscheinungsweise der Farben, Berlin, 1925.

[3] J. Exper. Psychol., 17, 1934.

[4] Staples, R., The responses of infants to colors, J. Exper. Psychol., 15, 1932.

[5] Gale, A. V., Children's preferences for colors, color combinations and color arrangements. Chicago, 1933.

school children in Chicago give the order: O R Y B. But there is no other well-known literature than his study in which the order of O is found in the first rank. Perhaps that tone which he calls orange does not have the real normal saturated orange tone. The investigations of more than one thousand children and adults[6,7] show also the order of colour preference in general as B G R Y and one of them found white in the lowest rank.

In the case of high school students and grown men we know of a remarkable study by Walton, who for fourteen years investigated the preferences for 18 colour tones with the method of paired comparison. This experiment had an excellent procedure in this respect that they allowed subjects to look at colours as closely as they cared to, because colour loses its perceptional original colour tone in proportion to the distance of the subject from the colour. In the graph of the colour preference for these 18 tones obtained by means of that method, the regular waved curve will be found. B G R exist on the upper position of the curve, but O and Y in the lower position. However secondary colours seem to exist in the curve derived from fundamental colours as serial points with each degree of likes and dislikes.

Table 8 Expressive values for colour tones from memory

	red	orange	yellow	green	blue	purple	white	grey	black	
Favourite	31	5	38	69	71	30	33	8	15	300
Unfavoured	45	23	50	9	8	30	5	25	19	214
Noble	9		24	21	35	40	46	7	30	212
Vulgar	49	15	35	9	9	28	3	2	2	152
Youthful	45	5	26	67	27	11	7			188
Aged	21	9	32	5	2	8		50	34	165
Lively	80	6	26	14	8	13	6	1	1	155
Lonely	2	3	8	8	43	11	16	36	20	147

Numerals show the numbers of all colours mentioned by our subjects.

[6] Katz & Breed, Garth, Walton & Guilford etc. pursued investigations with more than one thousand men.

[7] Walton, W. E., Guilford, R. B. & Guilford, J. P., Color preferences of 1279 university students. Am. J. Psychol., 15, 1933.

Table 9 Expressive values for brightness of colours from memory

		red	orange	yellow	green	blue	purple	white	grey	black	
Favourite	Tint	15		15	15	35	10	33			123
	Middle	14	4	18	51	36	16		8	15	162
	Shade	2	1	5	3		4				15
Unfavoured	Tint	10		1		2		5			18
	Middle	25	20	35	7	6	26		25		144
	Shade	10	3	14	2		4			19	52
Noble	Tint	3		15	2	19	8	46			93
	Middle	5		7	15	16	29		7		79
	Shade	1		2	4		3			30	40
Vulgar	Tint	11		2		3	2	3			21
	Middle	29	14	24	8	5	20		2		102
	Shade	9	1	9	1	1	6			2	29
Youthful	Tint	32		11	20	16	7	7			93
	Middle	13	5	15	46	11	4				94
	Shade				1						1
Aged	Tint		1					4			5
	Middle	1	6	25	2	1	4		50		89
	Shade	20	2	7	3	1	4			34	71
Lively	Tint	11		1		2	2	6			22
	Middle	66	6	24	14	6	11		1		128
	Shade	3		1						1	5
Lonely	Tint			4	2	20	4	16			46
	Middle		2	3	5	23	7		36		76
	Shade	2	1	1	1					20	25

Table 10 Expressive values for perceptional saturated colours (1)

	red	orange	yellow	green	blue	purple	white	black	
Favourite	28	19	22	86	46	44	15	21	271
Unfavoured	60	35	45	26	18	59	11	4	258
Noble	16	11	13	50	52	70	21	27	260
Vulgar	46	44	30	25	14	61	4	3	229
Youthful	24	45	35	102	26	13	2	4	251
Aged	12	2	11	38	8	95	28	6	200
Lively	66	68	46	11	22	21		1	245
Lonely	2	2	13	72	22	56	6	4	177

Table 11 Expressive values for

	red					orange				yellow					
	1	2*	3	4*	5*	6	7*	8	9	10*	11	12*	13	14*	15
Favourite	13	9	1	5		2	1	10	6	6	1	5	2	7	1
Unfavoured	24	15	4	8	9	10	4	11	10	7	12		2	4	20
Noble	11	4	1				2	4	5	1	1	4		6	1
Vulgar	15	12	5	1	13	8	14	11	11	11	5	1	1	3	9
Youthful		3	3	6	12	4	4	25	12	4	1	7	5	17	1
Aged	8	3	1					1	1	1	2				8
Lively	4	6	12	34	10	6	12	42	8	18	5	9	6	8	
Lonely	2								2	1	1	3		2	6

* Wundt's colour papars. The others are from Bradley's colour papers.

Accordingly to Paulson and Nielsen[8] the fact that red, for example, is preferred does not mean a preference for all sorts of red, and they included in this fact of a degree of likes and dislikes all similar colour tones of red.

Of the few investigations in which coloured lights were used as stimuli Walton and Morrison[9] observed by the method of paired comparison colour preference for lights cast on a frosted glass, by Mazda coloured lamps placed opposite to it. The order of preference remains after all B G R Y W, about the same preference as for coloured papers. When coloured lights are equated for brightness by the flicker method, there can occur no variation. They say that the basis of the judgement of preference rests chiefly on many sorts of social influences or on individual experiences and that moreover the fact that there is no great difference between races may be explained from the internationalization of their own civilizations.

It is indeed true that Japanese children in America[10] prefer,

[8] Certain color preferences of college students. Trans. Utah. Acad. Scie., 10, 1933.

[9] Apreliminary study of the affective values of coloured lights. J. Appl. Psychol., 15, 1931.

[10] Gart, T. R., Ikeda, K. & Langdon, R. M., The color preferences of Japanese children. J. Soc. Psychol., 2, 1931.

perceptional saturated colours (2)

green							blue				purple						w.	bk.
16*	17	18	19*	20*	21	22*	23	24*	25*	26	27	28*	29	30	31	32*	33*	34*
13	11	24	9	12	9	8	7	13	12	14	13	13	6	3	9		15	21
1	2	2	1	7	6	7	4	2	9	3	3	5	5	10	14	22	11	4
5	8	5	2	10	4	16	23	7	7	15	13	16	18	4	15	4	21	27
1	2	5	1	4	8	4	3	2	9		3	3	1	11	15	28	4	3
27	19	38	7	4	6	1	8	12	4	2	2		1	7	1	2	2	4
	1	1	1	3	1	31	2	2	3	1	9	21	22	5	33	5	28	6
2	1	7	1				2	4	15	1	2	2		4	4	9		1
1	5		6	20	15	26	7	4	2	9	13	6	27	3	6	1	6	4

exactly the same colours as white, Indian and negro children do. Grown up men in Japan prefer also G to R, while children and younder adults place R second, but those who under any influence of international civilization present other preferences than those of our civilized Japanese. We shall refer to this later.

Now we would like to present the colour preferences of the Japanese, the Formosan and the Korean children and adults investigated by our own Japanese. In these recent studies one may find no up-to-date method adopted for the determination of colour preference. Usually in Japan, we used colours from Wundt's paper as stimulus in the psychological experiment. Concerning the preference of children we must mention Imada's[11] study which deals with 1170 children from the 1st to 8th school year, of whom the 1st and 2nd year children were required to judge the most pleasant colour by individual test. The stimulus colours from Wundt's paper were in the form of $1\frac{1}{2}$ inches squares, pasted upon white papers $18\frac{1}{2} \times 12\frac{1}{2}$ inches. They give the order: B R G Y P O. School children older than ten years, prefer B without exception at first, and yet a turning-point of their preference seems to exist in the ages 8, 9 and 17 years. Growing

[11] Imada, M., Colour preference of children (in Japanese). Jap. J. Psychol. 1, 1926.

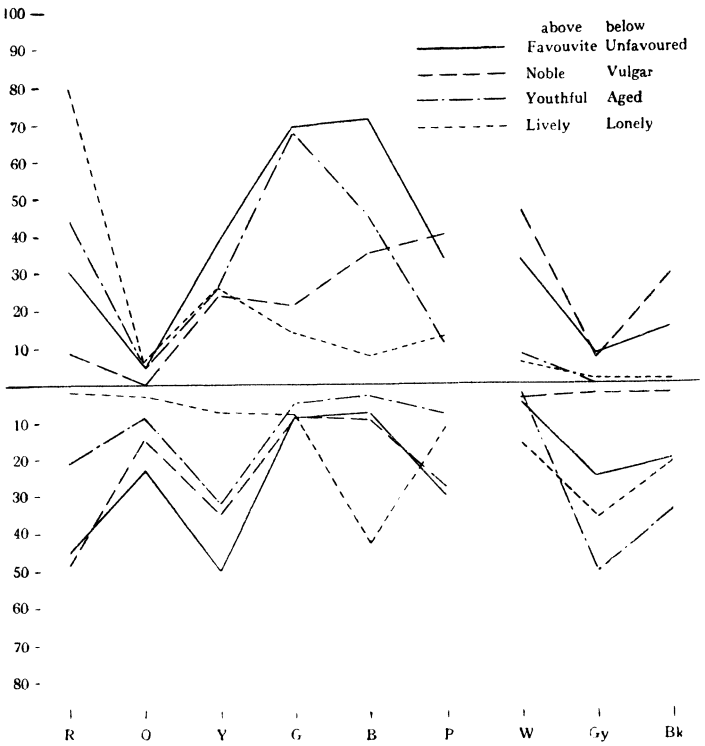

Fig. 4. Expressive values for colours from memory.

older was also found to raise B gradually and other colours have no special tendency of preference. In regard to sex he found it characteristic for the order to be : Male B for the first and R for the second or fourth ; for females R is the first. Males prefer Y more than females do.

Okuyama[12] investigated preference for Bradley's colour papers 4 × 4 inches with the unprecedentedly great number of 7271 school children. The order of colours preferred was B R G P Y O in average value and R B G P O Y in median value. From a mean variation we can see a great discordance of estimation of values in red, but little in orange. Males preferred B for the first,

[12] Okuyama, K., An investigation on colour preference and colour names (in Japanese), Report of the IInd meeting of the Jap. Psychol. Association, 1929.

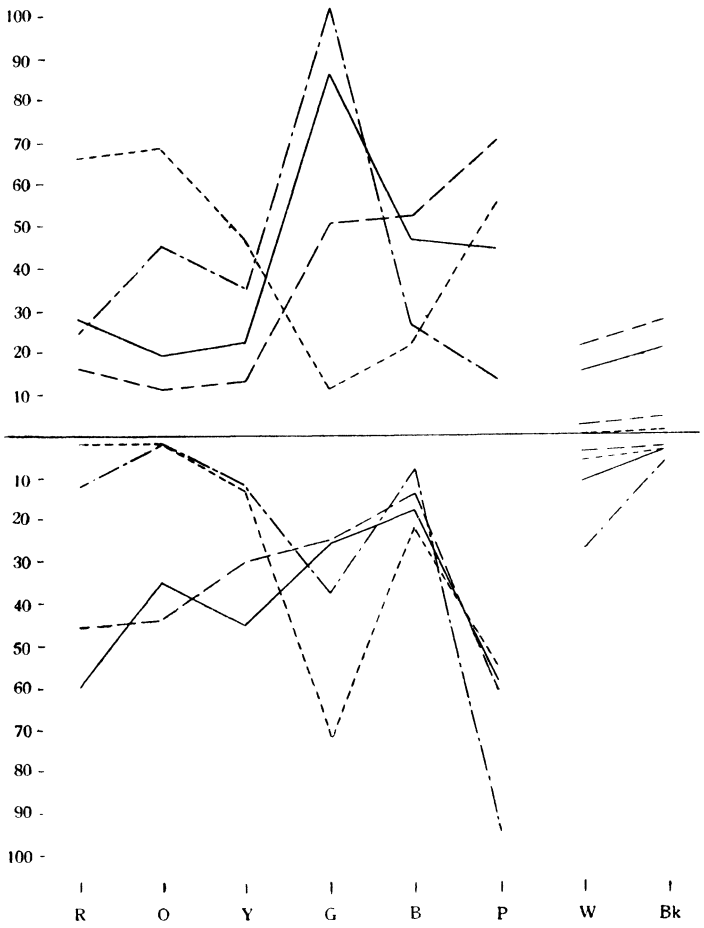

Fig. 5. Expressive values for perceptional saturated colours.

but females preferred R. Colours were divided into two groups for preference, one group preferred B G R, the other P O Y. But sinking preference for red which maintains first rank among younger school children was found also among those of increasing age from about 10 years and older.

With 249 adults engaged in all sorts of occupations Minaguti & Aoki[13] found the order of preference for 17 colour tones, dark red

[13] Minaguti, H. & Aoki, S., A study on colour preference of adults (in Japanese). Jap. J. Psychol., 1, 1926.

only excepted, from Wundt's paper 5.9 × 4.7 cm pasted upon each 7 × 6 cm card, as follows : With the principal colour tones only quoted, blue, violet, u-blue, and blue green were highest in the list, next in order were red and purple, green and yellow green, lower white and black, lowest orange, grey, yellow ; i.e. the order to be found, B R G O Y. The only investigation on colour preference of 210 aged people, from 60 to 90 years old, in Japan was made by Tatibana,[14] who found the order to be : B P G R Y O of Wundt's papers. Between male and female very few changes in preference were found in his experiment. But the former differs from the latter in this respect that aged males prefer B to a much higher extent than females do and orange to a much lower extent.

Of the changes of preference in races we may mention two studies in Japan. Ri & Amano[15] investigated the colour pre-

Table 12 Order of the expressive values for colours from memory (I) and perceptional saturate colours (II)

I	Favourite.	→ G	B	Y	P	R	O
	Unfavoured	← B	G	O	P	R	Y
II	Favourite	→ G	B	P	R	Y	O
	Unfavoured	← B	G	O	Y	P	R
I	Noble	→ B	P	Y	G	R	O
	Vulgar	← B	G	O	P	Y	R
II	Noble	→ P	B	G	R	Y	O
	Vulgar	← B	G	Y	R	O	P
I	Youthful	→ G	R	Y	B	P	O
	Aged	← B	G	P	O	R	Y
II	Youthful	→ G	O	Y	B	R	P
	Aged	← O	B	Y	R	G	P
I	Lively	→ R	Y	G	P	B	O
	Lonely	← R	O	Y	G	P	B
II	Lively	→ O	R	Y	B	P	G
	Lonely	← O	R	Y	B	P	G

R reds O oranges Y yellows G greens B blues P purples

[14] Tatibana, K., Colour preference of the aged (in Japanese). Jap. J. Psychol., 4, 1929.

[15] Ri, C. S. & Amano, T., Colour preference of Korean children (in Japanese). Report of the Vth meeting of the Jap. Psychol. Assoc. 1936.

Table 13. Number of all mentioned colours in the methods I and II

	Inherent Values			Expressive Values			
	I	II	Sum	I	II	Sum	
+ Side	776	963	1739	1135	1027	2162	3901
− Side	788	838	1626	675	864	1539	3165
Sum	1564	1801	3365	1810	1891	3701	7066

ference of 794 Korean school children, age from 7 to 14, with 2×6 cm Wundt's paper by a method similar to that rised by Imada and by individual test. The order was R B Y O P G Bk W, and this was divided into three groups concerning the preference, i.e. R B placed first, Y O P G next and Bk W lowest. R gradually loses its leading position during school days as is seen among Japanese children, so it is placed in the second rank among children over 12 years old and in the fourth rank among those 15 years old. As compared with the result of Imada's study, there was found a change between Japanese and Korean children. Both like R very much, but the large mumber of 44.7% Korean children preferred R to B, while Japanese, usually prefer B to R. Moreover, while the latter like G, but never O, the former do not like G much, but much prefer O.

We know of another interesting tendency of colour preference among Formosan and Japanese children in Formosa, which was found in one part of the investigation by Kuwata[16] on the psychical differences between them. He used 8 colour tones from Wundt's paper, pasted, annularly together, upon a large grey paper and let the subjects notice at the same time both the most liked and the most disliked colours. The result was that the most liked colours of 660 Japanese children were P and B, but R was preferred as first choice by 643 Formosan children who are descended from the Chinese. The most disliked colours were V and G for both Japanese and Formosan children. Formosan

[16] Kuwata, Y., Report of a comparative study on the mentality of Formosan and Japanese children (in Japanese). Jap. J. Psychol., 1. 1926.

females have a tendency to dislike Y. We can see on this fact two other notable points, one of which proves to be an influence of social interest, since the Japanese in Japan proper never prefer P for the first rank and do not dislike G as much as children in Fomosa do. Instead the Japanese have a rather pleasant feeling for G. The other point indicates a racial difference, because Formosans, perhaps as uncivilized Chinese, prefer R for the first choice and rather dislike G. Of people all over the world who have preferred R for the first rank, we have had evidence hitherto, of only the young children, of negroes, of full blooded American Indians, of Filipinos and of these Formosan children.

Sikiba[17] investigated the colour preference of 247 deranged adults and delinquent boys, excepting those of hard negativism and mutism, by an individual test similar to that used by Imada. Colours from Wundt's paper 1.5 inches square pasted upon a white paper 18.5×12.5 inches were used. In his study there can be found no essentially remarkable change from our healthy adults, but he concluded that the preferences of a deranged person are more similar to those of healthy children than to those of healthy adults, since the mental development of such persons remains similar to that of children. The most interesting fact dicovered was that the order is as follows: For manic psychosis R P G B O Y, for depressive psychosis B G Y O P R. The fact that the order of R and P is entirely reversed between them, can mean only an undoubted expression of characteristic difference in their mentality.

Generally speaking, it may be said that older Japanese children and adults prefer R a little more than people of the white race do, since the latter usually place R, instead of G, in the third rank, while the former put it in the second rank. B always occupies the highest position, and O Y the lowest, for both races. White and black seem seldom to be preferred.

Now, chroma and brightness (tint and shade) were dealt with as objects of experiment for colour preference, too. Cohn, J. had already studied on the preference for chroma of transparent colour

[17] Sikiba, R., Study on colour preference of deranged persons and delinquent boys (in Japanese). Jap. J. Psychol., 2, 1927.

light and had concluded that the higher the chroma of any colour is, the more pleasure it gives. Since a change of chroma noted by him in his experiment was in fact a change of tint, but not of chroma, his conclusion that man's preference is always for colours of higher chroma must not accepted too quickly. Titchner, one of the investigators who arrived at results contrary to those of Cohn, considered therefore two types of preference; i.e. one preferring colour of lower chroma, the other of higher chroma.[18] Guilford investigated emotional effects of 40 stimulus colours of various chroma, hue and tint by individual test. Colours were presented to a subject in a dark room under daylight-resembling lamps. In reporting his result he mentioned the fact that the greater the tint and the higher the chroma, the more a colour is felt as pleasant. Perhaps it is true that one is disposed to like less colours of deeper shade and also to dislike less colours of a greater tint

Now to return to our own investigation. This experiment differs from other experiments which had untill now been carried out, in that 34 perceptional saturated colours were used with both Wundt's and Bradley's papers pasted together upon one, large grey paper. For these colours the subjects were required to prefer, without limit of number, the colours to be preferred, with this differs moreover that the entirely free preference is studied for colour names, too. The subjects were to estimate both liked and disliked colours at the same time, in every case of method I and II.

Method I.

In which order did our subjects prefer colour names from memory? Before this experiment Chou & Chên[19] and Hirohasi[20] had studied colour preference for colour names. Racial changes of the order in preference should have been more prominent, originally, in the estimation for colour 'names' than in the affective

[18] Guilford, J. P., Op. cit.

[19] Chou, S. K. & Chên, H. P., General versus specific color preferences of Chinese students. J. Soc. Psychol., 6, 1935.

[20] Hirohasi, S., An experiment on beauty of colour (in Japanese). Jap. J. Psychol., 1, 1926.

	Favourite		
	Tint	Middle	Shade
red	peach pink 5 light peach pink 3 eosine pink 4 pink 2 light pink 1	ox-blood red 2 red 6 scarlet red 1 deep scarlet red 4 vermilion scarlet 1	dull vermilion scarlet 1 umber 1
orange		red orange 1 orange 3	dark orange 1
yellow	orange cinnamon 2 cream 12 light cream 1	brown 1 yellowish brown 1 brick red 1 golden yellow 1 yellow 12 lemon yellow 1 pale lemon yellow 1	dark brown 3 yellowish olive 1 dark lemon yellow 1
green	Veronese green 1 light yellow green 1 light green 13	yellow green 1 night green 2 green 42 deep green 3 cobalt green 2	deep indigo 2 olive 1 dark blue green 1
blue	Nile blue 5 pale Nile blue 2 peacock blue 1 pale blue 12 Salvia blue 8 greyish lavender 7	straw yellow 1 cobalt 11 blue 21 deep blue 2 indigo 1 violet 2	
purple	light mauve 7 rose 3	purple 13 deep purple 1	dark indigo 1 dusky madder violet 2 maroon 1
white	white 25 white cloud 1 milk 1 silver 1 silver grey 4 light mouse grey 1		
grey		grey 4 mouse grey 3 warm grey 1	
black			black 14 iron black 1
	123	162	15

	Unfavoured		
	Tint	Middle	Shade
red	peach pink 4 light peach pink 2 pink 2 cermeo pink 2	ox-blood red 2 red 21 deep red 1 deep scarlet red 1	dull dusky red 1 dark red 2 mars brown 1 umber 4 dark umber 2
orange		red hazel 1 orange 8 deep orange 1 English red 6 ochraceous orange 2 khaki 2	natal brown 3
yellow	orange cinnamon 1	brown 8 orange yellow 1 golden yellow 1 brick red 1 yellow 17 deep yellow 7	dark yellow 1 dusky drab 9 dark dusky drab 1 dark indigo 2 olive 1
green		green 2 deep green 3 blue green 2	dark green 2
blue	pale blue 1 pale indigo 1	blue 4 deep blue 1 loud blue 1	
purple		violet 1 deep violet 1 purple 13 deep purple 1 red purple 2 rhodamine purple 5 deep rhodamine purple 1 dark vinacious 2	maroon 2 burnt lake 2
white	white 3 cloud 1 gold 1		
grey		grey 14 dark grey 1 mouse grey 8 warm grey 1 lead 1	
black			black 18 blackish 1
	18	144	52

judgement of perceptional colours, because the deep, inherent associations of a race or nation have a greater activity in the former case than in the latter, in other words, because ideas have a more racial character, but perception has the characteristics of humanity. The results of Chou & Chên's experiment in the preference for colour names with 451 Chinese, age 12 – 25, by the method of paired comparison, show the order as follows: W R Y G Bk O V Gy. Hirohasi used 6 colour names in his experiment, for which 500 school children and 2091 adults preferred as follows. For school children, from I to VIII school years, the order was : Male G B Y R W Bk ; female, B G R Y W Bk. Contrary to the lest in perceptional colour, R was liked better, but W Bk were still estimated lowest as was the case in perceptional colours. But among older students it was found that, from the VI school years W was gradually raised and placed by females at last, in the first rank. Middle school girls also preferred W for the first in the order W G B Bk R Y. For male students, it was G B W R Y Bk ; the male is still preferring Bk for the lowest. Females have remarkable changes of preference among them, but males have not.

In general G B W are liked, but R Y and Bk are not so often preferred. The Chinese prefer R and Y to G, but the Japanese, both according to Hirohasi's investigation and to our own, like G most and, of course, B is always placed higher than R.

In our study, G and B (all sorts of greens and blues and so forth) are preferred almost equally higher, Y P and R come next, but O is liked by but few. In respect to tint it seems to be apparent that shaded colours are liked very little, shaded B, also which is originally of lower brightness, are never placed on the list of pleasant colour. But each tinted colour, independent of colour tone, can not always be estimated pleasant, and it should be noted that tinted colours of any given tone have only a favourite value. For example, even colours of middle brightness memorized by the name green and blue are favourite, and also tinted, light green, light blue and pink are preferred as : "I generally like tinted colours (Yamaki, Yosida, Matumura)". Of toneless colours, W is highest in favour, but the rank of W on the list of preference for all colours, nevertheless is lower than any to be

found in Hirohasi's investigation, though is rarely unfavoured, i.e. it has the smallest unfavoured value, greys and blacks are usually preferred least of all.

Unfavoured colours are Y R P, G and B are not disliked. In both favoured and unfavoured combined, G and B are found to be most favoured by some and are unfavoured very little by any, since Y P R are preferred by half of our subjects and at the same time, they are disliked by the other half, too. In this point O seems to be felt indifferently, or to tend rather to unfavoured estimation, and concerning these values they are entirely negative in any case. No females preferred for O. On the contrary R and Y affect one somewhat emotionally.

Then, what reasons are there for preference? Unconscious associations, which the subject himself is not able to state clearly, may dominate his preference, but we can almost definitely conclude as to what sort of colour he prefers and what sort of psychical impression guides him in preferring a colour. One of the reasons for this is that the colour gives an impression of purity or light. Also Japanese much prefer individual colour because of its 'light (frank)' and 'bright' nature, too, as follows:

"I generally like bright colours (Komatu)."

"White is pure and light blue is not muddy .... (Miyake)."

"I like the colours which are felt to be refreshing (Hase)."

"I like colours which are felt to be bright, pure and very sober, or bright black (Miyazaki)."

"For a simple colour, I prefer the simplest (Kawahara)."

".....", because it gives me an impression of lightness and clearness (Mizuno)."

"These give the feeling of quietness, but are vigorous and yet innocent (Yokozawa)."

"It gives me an impression of light-heartedness (Itō)."

As mentioned above, our subjects preferred colours because they were pure, light, clear or bright. And yet a number of subjects found the favourite value in colours, because these were 'tinted'.

"In general, I like light colours (Endō)."

"I like light and yet noble colours in general (Kemanai)."

"Favourite colours and light colours are nearly the same for me (Satō, K.)".

"Colours blended with white give me a more favourable impression than simple colours do (Nobeti)."

"I like, in general, tinted colours more than deep and sober ones, too (Murakami)."

"While colours that are too importunate and muddy give me an unfavourable feeling, any colour will be a favourite for me, if it is lightly tinted (Kumagai)."

"Colours which give us an impression of a mixture with dust are unpleasant, but adequately tinted colour is felt to be a favourite. When I even only look at such a colour, a pleasant feeling seems to fill my mind, but that is never in the case for a deep colour, because that is too stimulative (Kaneko)."

However, not a few subjects preferred reds. Although reds are essentially stimulative, excitant and affect our feeling intensively rather than give us an impression of brightness, many seem to prefer reds because of their vigorous youthfulness, for example: "It makes me think of passion as a flame of youth (Sumita)." But there are many colours preferred on account of their 'calm' and 'repose' as follows:

"I prefer cobalt green, because I feel reposeful at the sight of such a heavy and calm colour, I do'nt like primary colours or those which repulse my mind (Horiuti)."

"I like a colour which is as calm as the ocean (Kitazima)."

"I like reposeful and yet vivid colours, but I dislike loud ones (Hiraga)."

".... I prefer reposeful, noble and yet slightly tinted colours, but avoid preference for intense, primary colours and showy ones (Hase)."

"Calm and reposeful and yet tinted colours attract my mind (Yosida)."

"These are calm, noble and seem as if they were cultured (Ikeda)."

Some of the other subjects preferred a colour owing to its refreshing quality.

Then, in what state of mentality is a subject, when he gets a

favourite colour ? Perhaps he has a feeling resembling satisfaction such as he may feel, probably, when he gets repose or receives consolation, as :

"I feel as if I could melt into the colour (Miura)."

"When I see or recall Nile blue, my heart becomes mild (Takahasi)."

"Colour which adapts itself to my mind consoles me (Kamada)."

As the above statements indicate, one is liable to feel repose at the sight of favourite colours.

Reasons for dislikes in the matter of colour are to be found in impressions of 'repulsion' of colour as follows :

"I become disagreeable, with a start, at sight of red (Takahasi)."

"I dislike glaring superficial colours (Yaita)."

Of course, such colours which seem repulsive and which give the impression of destorying our repose, will be disliked. Moreover a reason for dislikes to primary colours, found in a number of our subjects, may be that those colours are 'too stimulative' for them, as :

"I dislike a loud (Hase), a confused, unsightly (Miyazaki) colour", or

"I have an unfavoured value for the colour, because it looks dirty (Mizuno)."

Such is the effect of mixed, compound colours having considerable darkness, as, for example, umbers and dusky drabs. And a colour, which gives the impression, as it were, of not fully entering our mind, is disliked, even though it is not fulsomely stimulative : "I dislike hazy, not clear colours (Teraoka)." Others said that they disliked the colours, because "these browns and greys give us an impression of melancholy (Satō)," or "I feel vulgar and inactive, when I see Hydrangea red, pink etc. (Yokozawa)."

As the following statements ; "I usually feel nearly queasy, when I call to mind deep pink and yellow (Hiraide)," and "Surely I have a tendency to avoid this disliked colour (Utimi)," show, the unfavoured colours give us an impression of opposition, while favourite colours seem to fuse into us and become part of us.

Method II.

When saturated colours only are selected for preference and are limited in number, the orders of preference of the subjects for each colour agree, naturally, to a considerable extent. And, from the point of colour tone, the order of preference in the case of perceptional colours is found to be nearly similar to that in the case of remembered colours. Although the procedure of this experiment was conducted as similar experiments had been in the past, the method of readjustment of results differs here from that in the former report, being a method that had not until now been carried out. Namely we took all the colours from Wundt's and Bradleys' papers together and divided them into six principal colour tones, red, orange, yellow, green, blue, purple and white and black (as is shown in Table 10, 11 and Fig. 5).

Although such a method of readjustment namely, that of taking both kinds of papers together, may seem inadequate in indicating a preference for normal, principal colour tones, it is on the contrary the most adequate procedure. Experiments with either of these papers have produced results as were lacking to some extent universal appropriateness, because a change found in preference for any colour tone depends sometimes upon a change of the kind of coloured paper used of the same tone. For example, even between greens of the so-called normal colour tone, there can often be found more or less of a perceptional difference of tone, so that their emotional values are not necessarily always agreeable to the same person. Such being the case, our subjects showed preference several times for Bradley's green (No. 18), which is a little glossy, rather than for Wundt's green. Further more the fact that the order of the preference for green from Bradley's paper was found to be in the first rank equall to blue in the experiment made by Okuyama, while green from Wundt's paper was placed in the third rank in Minaguti's experiment (p. 45), proves our assertion. In spite of the same tone, normal orange from Bradley's paper (No. 8) tended to be much liked, while Wundt's orange (No. 7) was scarcely preferred at all. So it was with violet; Wundt's violet was much more preferred than

Bradley's. We took all similar tones, however, from both normal colour papers, and put them under a given name, and so decided the colour preference for those principal colour tones. Thus it must be understood that greens (G) are of course all sorts of saturated green ranging from yellow to blue green (No. 16-22, in Table 11).

Our result, without observing distinction of sex, differs a little from the other hitherto carried out experiments. The following was found : G occupys absolutely the highest rank, next B and P are equally high, Y R and O are placed lower. Apparently both male and female like G best and O least. Thus we know that our preference for two sorts of normal colour papers, Wundt's and Bradley's, differs from that for only one of these. Further, the difference manifests itself most prominently in a preference for R, in other words, the perceptional R is preferred to almost the same degree little as R from memory in the case of Method I. While in method I G is preferred almost equally high to B, the perceptional saturated G in method II is preferred far more than B, which form rather a group with P. By the Japanese and the white race the principal colours liked have been in the order, B R G, but according to our investigation R sometimes liked a little and yet are sometimes disliked as much as P is, namely R has a low favourite value, and at the same time the greatest counter unfavoured value. The colours which are liked without question by most subjects and are disliked but a very little by others, are G and B only, while every other saturated colour may command for itself a half favourite and half unfavoured value (Fig. 5).

Particularly speaking, this greater preference for P is due to the high favourite value of violet which is involved in them, so Minaguti reported that violet was preferred as second, but that real purple was greatly disliked, and especially that no one liked Wundt's purple. So it is with bright red (No. 5). Toneless colours have always a lower emotional value for individual colour, but their value becomes higher, when they are judged at the same time with other colours : " .... black and white in themselves make no impression on me, but they seem to give me a refreshing feeling, when in contrast with other colours (Nobeti)." Even

individual black, such as the black of woolen cloth or paper may be preferred by a great number of subjects. But in fact, the black of the normal colour paper is too dirty.

A notable difference in sex is expressed in the female preference for O, to which they have a rather negative intention so that in general they like O very little, but dark red (No. 1) was disliked by only female, while males in general disliked it very much. Contrary to my expectation that probably females would prefer R more than males do, the result of our investigation did not establish such a fact. It is also evident that no female finds an unfavoured value in toneless black and white, and they prefer black much more than males do. Now, it is disappointing that we could not find out the emotional values for brightness in this experiment, since there were only saturated colours used.

How were our subjects impressed in carrying out this new method of preference for saturated colours which followed the preference for colours from memory ? Even with the same colour tone, judging between colour from memory and the actual, perceptional colour some differences of emotional values seemed to be as was said :

> "There is a great difference between the colour imagined by commonsense in idea and the perceptional normal colour of each tone (Hase and Ōtani)."
>
> "A great difference seems to exist between a preference for colour from memory and that for perceptional colour, and in a way it is a fact that an absolutely disliked colour from memory may become most favourable at sight of the perceptional colour table and that, also, the inverse phenomenon may happen, but as a rule neither green, red nor white have a change very much (Esatori)."

Probably a colour kept as an idea is not so simple as a perceptional colour, and various impressions, though unconsciously, may twine around it. It is also probable that these inherent, fixed impression may dominate over an emotional estimation for colour from memory.

As a result of the limitation for only saturated colours, the subjects felt some difficulty in selecting many colours as favourite

among the few, when they were obliged, whether willing or not, to judge emotional values. There is required accordingly a compulsory attitude of mind in the case of saturated colours, because the more or less tinted colours are usually, naturally preferred to these, and the fact that one could not find the same colour in perception, which he had been recalling as a favourite colour from memory, is a matter of course, as follows: "There is no favourite colour (Kumagai)," "I feel it difficult to find a favourite colour because of the simplicity of colour (Kawahara)."

Since preference for tinted colours is entirely lacking and yet since this very tint makes these colours so much liked, the reasons for preference must be as varied as in the method I. Some people, too, like calm colours, as has been said: "Deep, pure colour gives one an agreeable impression. Dark red (No. 1), green (No. 18), ultramarine blue (No. 25) etc. are most agreeable, because they give us an impression of invigorating and also make us feel pleasant. From tinted colour I receive no feeling of attractive bracing because of its feebleness (Kaneko)." Another said, "Yellows give me no favourable impression, as might be expected, owing to their hard stimulative nature, I am impressed rather agreeably by red, light green (yellow green) etc. (Asasita)." After all, the preference for saturated colours is due mainly to the 'calm' and 'refreshing' impression they give. However it is not always found that principal colours are especially preferred.

Noble – Vulgar

As one of the expressive emotional values we ought to mention the contrast noble and vulgar. The ancient people of Japan, as with those of other nations, found the emotional value either noble or vulgar not only in style but also in the colour of clothing, and so it continues even to this day. Although this noble-vulgar value so-called by us, does not mean here of course, only an upper and lower degree in social rank, yet it is chiefly concerned with the inherent association surrounding the latter. In 'noble' we find a higher complex feeling, amounting to a kind of reference and it also embraces an emotion of endearment, but never con-

tains an emotion of loathing in itself. Also, our subjects are not likely to find a noble value in unfavoured, disliked colours. On the contrary, about 70% of the colours estimated as noble come under favourite colours. In the same way, between vulgar colours and disliked colours the inverse relation is found.

In the history of the past, expressive value noble–vulgar was usually attributed to the colour of clothing. At this point we would like to make a slight reference to this colour value as estimated by Orientals. From ancient times to the present there have been four principal colours in India usually named in this order, blue, yellow, red, white, and the other unsaturated colours have never been preferred to them. When it is desired to specify any object, such as a flower, clothing, equipment etc., with a colour name, these four names only are always, so far as I know, used, as, for instance—a blue, a yellow, a red, or a white lotus. And of all colours white as we see in many texts is considered most noble; for example 'puṇḍarīka', which is found in the title 'Saddharma–puṇḍarīka–nāma–mahāyānasutra (Mahayanasutra of the true doctrine named white lotus)', means nothing but white lotus and this suggests that the sutra is to be the king of sutras as the white lotus is the king of flowers.

In China there was for a long time the idea of 'right' (principal) colours, and all other colours estimated as vulgar, or not noble. It was about the 7th century B. C. that purple came to be preferred and used as a colour for clothing, but until then, it had not been considered as noble colour, but as a secondary colour when compared with the five 'right' colours, blue, yellow, red, white, and black. However the fact that this purple became more fashionable in the 6th century B.C. and was then valued as more noble than the five principal colours was probably due to its popularity in the world of fashion in the Western countries, which was overspreaded with the introduction of Buddhism into China, since the nations in Western Asia preferred purple more and used it undoubtedly, according to the Old Testament, as the colour most valued for the clothing of a person of high rank.[21]

[21] Kamimura, R., Study on the culture of dyeing in the Orient (in Japanese). 1933.

In the Middle of the 7th century the five colours used for clothing, i.e. the habiliment that were formulated by Mikado Kōtoku were ; dark madder violet, light mauve, deep red, deep indigo and green. After about thirty years Mikado Tenmu revised that order for the colours of official uniforms as follows ; deep red, deep madder violet, light mauve, Oriental green, light green, dark slate purple, slate purple. It was not long before the system was again revised by Mikado Zitō to the following order of colours ; dusky madder violet, red purple, carmine, Oriental green, light green, dark Tyrian blue, Olympic blue. Thus shades of violet for clothing came to be most preferred as noble in ancient Japan. It is the colour which the Mikado himself or the Mikado's family or even special persons of very high rank only may use for clothing, but the masses are prohibited from using it, and it is called 'the prohibited colour'. Dusky madder violet, oil green (light elm green), a sort of blackish raw sienna etc. are known as the prohibited colours. Not only in clothing, but also in all other things, throughout one period of ancient Japan, i.e. in the time of Huziwara, purple was considered by everyone as a noble colour.

Method I.

While the perceptional colours estimated as noble–vulgar are almost equal in number to those of the favourite–unfavoured value, the circumstances in the case of remembered colours makes so great a difference that this value of noble–vulgar decrease remarkably to about 30% of the value of the favourite–unfavoured colours. Precisely speaking, the number of the value noble is 214, as is seen in Table 8, while those of the value vulgar is only 145, but on the contrary it is worth noticing that the value noble of toneless colours increases in general 60% in number, while the value of the vulgar decreases 86%.

Concerning the distribution of this emotional value, we find that B and P are estimated as most noble, next come Y and G with an almost equal value, but R ranks lees and O has no value noble at all. As the most vulgar colour R is mentioned first, next Y P and O and the least vulgar are G and B. Now taking both

	Noble		
	Tint	Middle	Shade
red	pink 2 grenadine pink 1	ox-blood red 1 deep carmine red 4	dull vermilion scarlet 1
yellow	orange cinnamon 3 camel 1 cream 10 light cream 1	brown 5 yellow 2	deep brown 1 dark brown 1
green	light green 2	green 7 deep green 3 cobalt green 4 blue green 1	deep indigo 2 olive 1 dull green 1
blue	Nile blue 2 pale Nile blue 1 light blue 10 Salvia blue 3 greyish lavender 3	Antwerp blue 1 cobalt 1 blue 11 deep blue 1 indigo 2	
purple	light violet 1 light mauve 6 whitish rhodamine purple 1	violet 2 antique violet 1 blue violet 1 dark soft blue violet 1 red violet 1 purple 22 deep purple 1	blackish violet 1 maroon 1 Hydrangea red 1
white	white 36 gold 1 silver 3 silver grey 4 whitish grey 1 light grey 1		
grey		grey 3 glossy grey 1 mouse grey 3	
black			black 27 glossy black 1 iron black 2
	93	79	40

	Vulgar		
	Tint	Middle	Shade
red	peach pink 5 pink 4 cameo pink 2	red 16 deep red 6 pale red 1 bright red 1 scarlet red 1 fresh colour 1 vermilion scarlet 3	dull red 1 red umber 1 umber 6 dark umber 1
orange		red orange 1 orange 4 red yellow 2 English red 3 ochraceous orange 3 khaki 1	yellow brown 1
yellow	light yellow 2	brown 6 yellow 16 deep yellow 2	deep brown 1 dull yellow 1 black yellow 1 dusky drab 5 dark dusky drab 1
green		olive ochre 1 green 2 deep green 4 blue green 1	deep indigo 1
blue	peacock blue 2 pale blue 1	Vandal Poel's blue 1 blue 1 deep blue 3	black blue 1
purple	greyish lavender 1 light mauve 1	blue violet 1 violet 1 purple 10 red purple 1 rhodamine purple 6 deep rhodamine purple 1	dull rhodamine purple 1 maroon 4 Hydrangea red 1
white	gold 3		
grey		grey 2	
black			black 1 soot 1
	21	102	29

values, noble and vulgar, B is noble and the least vulgar, but P has no small value vulgar at the same time, so is G somewhat. The emotional value of Y is half noble and half vulgar. O and R are in general called vulgar, and especially R O and Y which form a group of so-called warm colours are not in general estimated as noble. Of toneless colours W and Bk have a higher value noble, but gold is vulgar.

In the noble colours from memory, we find the names blue, light blue, green, cream, deep red, purple etc. On the contrary yellow, red, pale red, and umber which are unsaturated, and also the shaded colours of yellow or orange, and purple have the value vulgar. Only two subjects preferred yellow colour as noble, while to 16 subjects it was vulgar. But the value noble for blue, as opposed to yellow, amounted to 11, while for the value vulgar there was 1 only. No one thinks of red as a noble colour, but it is rather vulgar to some extent. Some colours which come under the name purple, such as violet for instance have the value vulgar to a small extent, and also many of the P's which are estimated as vulgar are red purple. Toneless white was estimated noble by 36 subjects, but white never has the value vulgar.

With the exception of black which has a noble value, colours of middle brightness or shaded colours are generally estimated more vulgar than noble. However, colour that was formerly estimated as noble such as that which was used for the clothing of the nobility of ancient Japan tended rather to shade or deep colours as, for example, blackish violet, raw sienna or deep red, which was unlike the present estimation for individual colour.

On impressions of noble value our subjects deposed as follows:

"Antique (dusky madder) violet - - - it gives me an impression of aristocracy (Teraoka)," or

"Black has solemn nobility, purple, gay nobility, blue, calm nobility (Yosida)," or

"Grey, and mouse grey - - - are suggestive of the possessor of refined noble sentiments, but red, yellow, and green are primitive and vulgar (Ikeda)."

One reason for any colour's giving the impression that it is noble may be the feeling of 'frankness' which accompanies it, as has been

said: "It makes me feel noble, because it is frank (Miyake)," and "A too deep colour or deep and gaudy colours give us vulgar impressions (Murakami)." Although an "impression of a little calm (Satō)" may be the reason why some present colour is increased in value as noble, this 'calm' can not be absolute calm, but is usually accompanied by a sort of gaiety. Also it is correct to say: "Silver grey, dull vermilion, purple - - - such colours, which decrease a little in colour tone and yet give a feeling of gaiety, may be felt to be noble colours, (Nakano)."

While an estimation for 'noble' colour is comparatively easy to give, it is, generally, rather difficult, unless there is some other colour combined with it, to find the emotional value vulgar unlike other expressive values for individual colour. This is confirmed by the following deposition:

> "I cannot feel a vulgar value for only one colour (i.e. for an individual colour), but only when the colour is combined with an other (Yosida),"
>
> "Though emotional effects are produced by each colour, many of these effects become more marked when colours are combined than for one individual colour. If I think of a colour I dislike, when estimating a noble–vulgar value, any other colour which formerly has given an impression of great dislike or vulgar value is recollected at the same time in association with it. So it is in the case of the recollection of liked, noble colours (Sōma)."

When one speaks of the noble or vulgar in colour, it is not always, necessarily for one colour alone, but there may be a colour combination or colour harmony as the main incentive for an effective estimation.

One characteristic of expressive emotional value lies in the fact that the value varies according to the object on which the colour is found. Also it is true that a feeling of vulgar value for a colour at one time experienced in association with some disliked object is remembered vividly, though the memory may frequently become attached to the colour itself, rather than to the association. The following indicate this:

> "Pink - - - it makes me think of the parasol of a young female,

vermilion scarlet - - - the vulgar skirt of some female (Sumita),"

"A mixture of white and green - - - I sometimes see such a combination of colour on book covers etc. It gives me a feeling of deep noble value (Yosida, K.),"

"Unsaturated rhodamine purple - - - I think of the colour of the colour of a country lass (Atumi)."

A quotation taken from the history of Japan stating that the expressive value noble–vulgar depends, greatly, upon the association with an object on which the colour appears, explaines the above-mentioned preference for purple in the period of Huziwara. That purples became fashionable as the best colour for every one at that time and that the colour signified the most noble value, was due to its association with the nobility of the Huziwaras (Huziwara in the Japanese language means a field of wistaria→wistaria flower → light purple of greyish lavender→ purple), who held the greatest political power in those days. Such an association seemed to make the expressive value noble of purple much richer. Now, on the other hand people have learned to enjoy colour feeling for 'colour names' or 'colour symbols' only in consequence of the fixation of association, as an ancient female once said: "A visit to the Kasuga Shrine (the shrine of the Huziwaras), dark slate purple cloths and all other purplish shades are just about perfect, so are purple flowers, purple thread, purple paper ... (Makura-no-sōsi)."[22] Black was associated with darkness, and was also rather despised as a loathsome colour which came to be considered as a devilish colour. Such being the case it was once used to describe an immoral mind, so that it was said, the 'black mind.'

Method II.

The expressive value for a saturated superficial colour indicates, on the whole, a similar curve to that in the case of Method I, but the former can in general be higher than the latter (Fig. 4, 5).

[22] This book was described by Seisyōnagon, a famouse lady writer in the period of the Huziwara.

The saturated P is estimated as much more noble than B is, and O is liked more or less by males, while females never show this value for colours ranging from orange to yellow, but no one estimates red oranges noble. This is a difference found between them. The order of this value is found to be : P in the first, next B and G equally in a group, then R, Y and G equally and remarkably lower. Concerning the value vulgar we find here one contradictory fact in that P is estimated most vulgar, too, equal to R and O; and in this order Y, G and B are not vulgar at all. After the method of our readjustment P has, as just above mentioned, the contrary values noble and vulgar to an equal degree and the reason for such a tendency of feeling must lie in the fact that violet alone of all the hues involved in those P's, is estimated absolutely noble, while the other purples, especially redish purples are apt to show the value vulgar. The value vulgar of toneless colours is lower as is shown in Method I.

Precisely speaking, violet is noble, but purple is vulgar. Of the Bradley's light blue (No. 23) and blue (No. 26) are estimated noble, and it is especially noted that the latter has no vulgar value, and that u-blue seems to be estimated very noble because of its hard stimulus. Though Wundt's blue green is a little noble, no other green is estimated noble to any great degree. All Y's, except orange yellow (No. 10) which has a small value vulgar, are in general felt almost indifferently. While yellow was, once upon a time, estimated noble in China and it gradually became a prohibited colour, the Japanese have taken an indifferent attitude towards it from ancient times. Any yellow flower indeed except a yellow rose was scarcely ever mentioned in the 'Tanka' poems by our Japanese. It is said that our nation does not feel much interest in yellow, also that we do not care for any painting in water-colours in which yellow predominates and even the recent famous painter Gahō Hasimoto could not by example show how to use yellow suitably in painting, though it is much and used by European painters. It must be that the Japanese do not have a good understanding of yellow. That our painters has not indicated a desire for the use of yellow may possibly be due partly to the mangel of yellow colours, but we find no mention of

there having been any interest for yellows in our ancient literature, either.[23]

Youthful – Aged

The feelings youthful or aged are frequently caused by association with colours of clothing and furnishings used by young or old people, and with the colours of nature such as the youthful value of the green of young leaves. Of course, a colour used in furnishings for the young must first be considered as to its suitability for him from a psychological point of view. If it indicates liveliness, freshness and a little incitement as a mental effect, it would come naturally to be used as a youthful colour. The other expressive values are not subordinate to this expressive value, but the impression of youthfulness of colours is always independent in our minds.

Method I.

The order of distribution of the value youthful differs from that of the above two values as follows. R, next to G, has a relatively great value, but B does not so much cause a youthful feeling. As we said in the preceding report (this Folia V/I, p. 27), G has a great subjective brightness and next comes R, but except for this one point of similarity between them, the curves of the expressive value youthful and the inherent value brightness do not run parallel to each other. It must be understood, too, that the inherent value brightness does not form a factor of expressive value, when we investigate the emotional value aged on the opposite side. R is youthful next to G ; Y is less so, B and P are still less and O is the least youthful of all. As to the value aged we find Y most aged, R and O less aged and P, G and B least of all (Fig. 4). There can be found no youthful feeling for W probably because of the mangel in tone and greys being stationary, are also felt aged very much to a great extent, Bk too, is aged to

[23] Maeda, T., Colours seen by the people in the Middle Ages (in Japanese). Psychol. Study (Sinrikenkyū), Vol. X. p. 67, 1918.

some degree. Greys and blacks never indicate the value youthful, which it is perhaps the result of a fixed association of colour with names and symbols.

Of green colours which give the most youthful feeling, the name green amounts to 70% of the number of all colours mentioned as youthful colours. Only one subject estimated green as aged. Next, light green is most youthful. Many of the reds which have the value youthful are given the general name 'pink', but dark reds make us feel aged. The most aged colour of all is brown and next come the colours represented by the word umber.

In respect of tint and shade, the colours which have the value youthful are almost always tinted ones, and are those colours known by the names green, yellow, red, and blue which indicate greater subjective brightness (Table 1). Deep indigo is the only dark colour which indicates the value youthful. I think, no colour will give the feeling aged, when it is tinted. One subject suggested that any colour, if it is accompanied with 'tint' and 'warm' tones, results in the value youthful: "Eosine pink, light purple, Salvia bulue - - - light and warm colours in general are youthful (Yosida)." On the contrary medium or shaded colours, particularly, those of tones ranging from red to yellow, have the value aged; as for example: "Brown - - - a sober colour gives us the impression aged (Murakami)." We have said that this feeling depends much upon association, but we received a few depositions from our subjects, of which the following are typical: "Dusky drab - - - I took this colour for aged from an association with the atmosphere of the aged (Komatu)" and " - - - -, because green is the colour of young leaves (Teraoka)."

In the depositions concerning this emotional effect accompanied by colour, the followings are mentioned:

> "Green - - - a colour which gives clearly a feeling of relief like a field in the spring, but iron black - - - rusted or withered (Ikeda),"
>
> "Deep indigo, green, peach pink - - - make us think of things sprouting, but English red, silver grey, brown, black - - - give us an impression of losing vigour (Miyake),"
>
> "Purple has the fresh youthfulness which one feels after an

	Youthful		
	Tint	Middle	Shade
red	light red 2 peach pink 11 light peach pink 7 whitish peach pink 1 eosine pink 4 pink 7	ox-blood red 1 red 7 scarlet red 4 madder rose 1	
orange		orange 5	
yellow	cream 7 light yellow 3 Naples yellow 1	yellow 15	
green	light yellow green 2 light green 17 glaucous green 1	citrine 1 yellow green 1 night green 1 green 41 grass green 1 sea green 1	deep indigo 1
blue	hile blue 6 pale Nile blue 1 peacock blue 1 light green blue 1 light cobalt 1 light blue 2 Salvia blue 1 greyish lavender 3	cobalt 1 blue 9 indigo 1	
purple	light mauve 6 rose 1	violet 1 purple 2 deep purple 1	
white	white 5 whitish 1 silver 1		
	93	94	1

	Aged		
	Tint	Middle	Shade
red		red 1	dark red 1 umber 31 black umbr 2 dark umber 2 natal brown 2
orange	light English red 1	orange 1 English red 3 ochraceous orange 2	dark English red 1 sepia 1
yellow		brown 24 yellow 1	black brown 1 Vandyke brown 1 deep brown 4 dark yellow 1
green		green 1 cobalt green 1	deep indigo 2 dark green 1
blue		deep blue 1	dark blue 1
purple		purple 4	dark purple 1 maroon 2 dark Hydrangəa red 1
white	white 1 sliver grey 2 light grey 1		
grey		grey 26 mouse grey 24	
black			blackish grey 1 lead 1 iron black 3 black 29
	5	89	71

early summer rain, and light English red makes us think of a deeply-furrowed aged face (Kemanai)."

Thus colour which has the emotional value youthful affects one with a feeling of 'freshness and clearness', but that of the value aged gives a feeling of 'not energetic'. "Youthfulness" in our Japanese language is frequently expressed by the two words 'blue-spring' in one word. That is, since blue is used not only for the meaning of youthful, but also was former by pronounced youthful ('waka' in Japanese), we have for example, both 'blue (green) grass' and 'young grass' pronounced waka-kusa (young grass).

Method II.

When colour is limited to the saturated tones, a different curve results from that in the case of method I. O raises the curve, P greatly increases its value aged and G also has this great value. It is remarkable that G indicates an exceedingly high grade of the value youthful, a circumstance which had never hitherto been mentioned in expressed emotional effects, so that the number of the mentioned colours amounts to 40% of the whole number estimated (Fig. 5 and Table 10). O which is least youthful, now occupys a comparatively higher rank in the curve on the plus side. Such a raised value of the oranges on the plus side of the emotional colour effect is elsewhere found in the case of the value lively. After this Y, B and R are almost equally low, and P is the lowest. Since, it is seen from the emotional effect 'aged' that P has the greatest value, and it may, therefore, be concluded that P indicates the most aged and the least youthful values of all. G which indicates the value aged is not really, normal green or yellow green, but what we know as Wundt's blue green (No. 22). Although only two of our subjects estimated O aged, O gives also the impression youthful.

Precisely investigated, yellow green (No. 16, 17) and Bradley's green are felt to be very youthful, but Wundt's green is a little older, in consequence, I suppose, of its too quiet tone. Of all O's the bright colour which inclines towards yellow has the greatest

value youthful, as is the case with citrine (No. 14). Red and light red, unlike dark red don't give an impression aged. From ancient times and even up to the present day in Japan, old women never have the custom of using red in their clothing or personal ornaments, except in the case of some particular ceremony. If an old woman wears clothes of a redish tinge, she is usually considered to be a little mad. Some of our subjects said that saturated reds are not suitable to be estimated as aged. Judging from the emotional value of these colours, the mental effect of colour which gives us an impression youthful seems sometimes to be caused by its 'vigorousness or its warm stimulative quality', and a colour that is both 'light and bright' is not always suitable to be given value youthful. Moreover the impression 'lively' for any colour does not always result either in the emotional effect of youthfulness as will be seen, later, from the value lively-lonely treated below. However an impression of self-possession in some colour may cause us perhaps to judge its value as aged, as: "I preferred blue green for the feeling of self-possession it gave me (Ikeda)."

There can be no change between male and female.

This value youthful has its highest position in G, while G is almost greater concerning inherent values bright and light, and yet occupy a much higher position on the plus side of these values (Fig. 3). It does not suggests, however, a fact that the value youthful has a necessary relation with those inherent values. Toneless colours have in opposition to colour from memory nearly no value youthful, and the value aged is to be found comparatively often in W, but rarely in Bk. The value youthful of white shows the greatest of all expressive value. That white gives us the impression aged, though it has great brightness, may be due to an association of poorness and weakness in content.

Lively – Lonely

Now we mention the last expressive emotional value lively–lonely. This emotion can sometimes be derived from the feeling excitant-calm, but there may be no causal relation between these two kinds of emotional value, i. e. we can note an excitant and

	Lively		
	Tint	Middle	Shade
red	light red 1 peach pink 5 pink 2 eosine pink 3	red 56 deep red 1 scarlet red 1 deep scarlet red 7 vermilion scarlet 1	carmine 2 umber 1
orange		orange 4 deep orange 1 English red 1	
yellow	cream 1	reddish yellow 2 brown 1 golden yellow 1 yellow 20	yellowish umber 1
green		green 11 bright green 1 bluish green 1 grass green 1	
blue	pale Nile blue 1 Salvia blue 1	cobalt 1 blue 5	
purple	rose 2	violet 1 purple 7 red purple 1 rhodamine purple 2	
white	white 1 white cloud 1 milk 1 gold 3		
grey		mouse grey 1	
black			black 1
	22	128	5

	Lonely		
	Tint	Middle	Shade
red			dark red 1 black umber 1
orange		orange 1 ochraceous orange 1	sepia 1
yellow	light brown 4	brown 1 yellow 1 bluish yellow 1	black brown 1
green	light green 1 light blue green 1	green 5	Oriental green 1
blue	Nile blue 6 pale Nile blue 1 light blue 5 Salvia blue 4 light Salvia blue 1 greyish lavender 3	cobalt 1 Vandal Poel's blue 1 blue 19 indigo 2	
purple	light blue violet 1 light mauve 3	violet 1 purple 6	
white	white 10 light white 1 silver 1 light grey 3 silver mouse grey 1		
grey		grey 28 mouse grey 2 light black 6	
black			deep grey 1 iron black 2 black 17
	46	76	25

yet a lonely colour or a lively colour which is not excitant. We know that even many relatively calm people prefer red and it is perhaps because it makes them feel more lively though it is not an excitant for these. Therefore I have attempted to investigate particularly the emotion lively-lonely of colour as it is usually estimated by Japanese. Sometimes this value lively-lonely of colour in clothing is called by an other name gay-plain, as: "Gay colour is lively (Odasima)."

Method I.

That there is more difficulty in estimating this emotional expressive value for individual colour than there was in the last named value youthful–aged can be understood from the number of colours mentioned by our subjects, and also because the number amounts to 40% less than to that of the favourite–unfavoured value. Thef ollowing depositions indicate such difficult estimations for individual colour and yet this value is found rather in combinations of colour or in coloured object rather than alone: "For one colour only I can not estimate this value (Abe)," or "Estimation varies with changing moods, but in general I seem to feel lively, when many bright colours are found together (Komatu)."

Concerning the value lively, R has the greatest value, next Y and then all other colours are equally lower. Since the emotional value lonely of B is greatest and P and G rank equally next to it, Y, O and R have the lowest value. The curves of this value and the value warm–cold do not run parallel to each other. However the value lively-lonely seemed to be a significant value when accompanied by the value warm–cold, though the latter is not considered a factor for the former. Then, "I do not feel lively for any colour, if it is wanting in warmth (Yaita)," and "R and P which give a warm feeling have the value lively (Yosida)."

It is also very notable that the most excitant R is without doubt estimated as the most lively colour retained in the memory, and that the saturated O which has the greatest inherent emo-

tional value warm is felt most lively at the same time. Also there is undoubtedly some association between these emotional effects excitant or warm and lively. Then, again we have blue from memory and saturated blue green as the most lonely colours and yet each of these colours has almost the highest value of cold or calm. So we would suggest here, too, an association between the emotional effects calm or cold and lonely. But the feeling lively–lonely is necessarily more complicated in its process of establishment and in its contents than the inherent emotions are.

Colours which are estimated lively under the name 'red' amount to 70% of all the numbers of mentioned reds. However, it has been pointed out that O has the greatest emotional value lively in perception, but the least of such value when the estimation is made from memory. Why is this ? Concerning the oranges we find this fact that the inherent emotional value warm-cold can never be neglected even for colours from memory (Table 1). It is probable that we are not absolutely indifferent to O' in our feeling, and that the change of estimation which is found to exist, as above mentioned, between perceptional and remembered colours is due to a fixed difficulty in associating O with its expressive emotional colour effect. Moreover, since association with the inherent emotional value warm is alone dominant in our natural, mental attitude, other effects than that of warm do not come under our notice and are therefore hard to be retained in our minds and to be directly recollected.

Owing to a lack in colour tone and to their less stimulative, toneless colours have almost no value lively as : "Because there can be no variation in black (Miyake)." On the contrary it gives the impression lonely, and grey has the greatest value lonely of all as : "I feel solitary when I see grey (Hase)." This is probably, because there is a symbolic association with grey dwelling in our mind. Colours which give a grave impression and shaded colours are not lively. Though some subjects feel lonely looking at orange or pink, this estimation is entirely the result of accidental, individual association such as : "From an association with loneliness in evening (Mizuno), and "From an association of romantic sentiment with pink paper-lanterns (Kemanai)."

A notable point of difference between this value and other expressive emotional values is found in the fact that the value lively-lonely has complicated contents. Some explained this feeling lively, exaggeratedly as : "Stimulative, intense liveliness (Miyake)," "the liveliness of the brass band of a circus (Kemanai)," or "to being in a festive mood (Ikeda)," and others indicated similar light liveliness. About loneliness there is a lower degree indicated by the following feelings mentioned by some subjects : "That which makes us think of calm in autumn (Ikeda)," or "I become naturally entirely calm, when I think of black (Kamada)," but other subjects felt a positive feeling of solitude, true loneliness. After all, this value lively-lonely changes easily according to the individuals who are influenced by it.

Method II.

The curve of the emotional effect for saturated colours differs from that of other expressive and inherent emotional values. Even with R and O in one group, and next Y occupying a higher rank than G, B and P in another group, still this shape differs some what, naturally, from that of the value warm. In some points the curve of the value lonely seems to be similar to that of the value aged, though G lies in a higher and P in a lower position, as compared with the distribution of the value aged (Fig. 2 and 5). As is seen in Table 10 and Fig. 5, the order of the value lively and the reverse order are in complete accord with each other, and also the curves on the upperside and the underside run nearly parallel.

As the most lively colour we must mention Bradley's orange, and next to that Wundt's red and orange yellow (No. 10), though the value of these lessens remarkably. It is true that the liveliness of B contribute to the comparatively higher value lively of u-blue which is a little excitant. The liveliness of P is, of course, no other than that of redish purple which some one has described as "a feeling for loud rhodamine purple." Bradley's green has the value lively of G but never the value lonely, but as soon as green acquires a blue tone, to even a small extent, it immediately

becomes lonely. It is naturally blue green that possess the greatest value lonely, and next come the violets. The chief characteristic of the inherent emotional effect is 'calm and cold' while that of violet is 'dark and heavy'. On the contrary lively red is rather stimulative, orange is warm and bright, as yellow is also. Then, in opposition to the emotions lively and lonely for colour we have the contrast of the inherent emotional effects excitant-calm, warm-cold, bright-dim, or light-heavy, independent of each other or sometimes some of them together.

Summary and Conclusion.

(1) Between the affective values of all colours from memory and the given saturated colours in perception changes in the order and in the degree of estimation for colour may be found, and in all colour tone it is only the value Excitant of the inherent colours and the value Unfavoured of the expressive colours that indicate any similarity in the tendency for emotional estimations for colours both from memory and for those in preception.

(2) O and G indicate the most remarkable changes of the same value between remembered and perceptional colours; O in perception as compared with O from memory raises the values Warm, Bright, Youthful, and Lively, and lower the values Light, Dim, and Vulgar, G raises the values Bright, Light, Calm, Cold, Youthful, Aged, Lonely. It means that the affective values of those colours are retained either more vaguely or more distinctly in our minds than they are, in perception.

(3) That the opposite curves of each reverse inherent value run regularly parallel to either side of the axis of the coordinates, suggests inconsiderable, accidental and individual influences on estimation. For this reason the value Lively-Lonely is felt only in perceptional colours, toneless colours excepted. In other words, an expressive value depends greatly upon individual association.

(4) In spite of a similar colour tone, two colours can take contrary values at the same time as, for example, blue purple which is most noble, and red purple which is most vulgar.

(5) The number of colours mentioned for estimation, particularly those of the expressive values, is generally smaller on the negative (minus) side than it is on the positive (plus) side, because usually we are in the habit of estimating colour from the stand point of its positive emotional effect. It suggests a weakness of colour feeling in the mind that the number of estimations of colour in perception is larger, the extremely limited in number, than the number of colours estimated from memory.

(6) The small number of toneless colours in perception indicates the fact that pure white[24] and black are indifferent values in the mind. However the large number of colours estimated from memory seems to be considered as a result of the fact that there is probably symbolic colour meaning dominant in estimating these.

(7) On the whole O seems to remain a relatively indifferent value in our minds, but for G we have a greater interest.

(8) Concerning the affective and yet subjective sensibility to colour, we required estimations according to the degree of the individual sensibility of our subjects and found 30% of the most sensitive, 60% of the medium and 10% of the least sensitive.

(Received 14 VI, 1938).

[24] Chinese prefer white for the first. Chên, N. C., The colour preference of 1368 Chinese students, with special reference to the most preferred colour. J. Soc. Psychol., 8, 1937.